

SEQUENCE LISTING

<110> RYU, WANG SHICK

<120> Hepatitis B virus vectors for gene therapy

<150> KR2000-21070

<151> 2000-04-20

<160> 5

<170> KopatentIn 1.71

<210> 1

<211> 235

<212> DNA

<213> HBV

<220>

<221> gene

<222> (1)..(235)

<223> Alpha-element of HBV

<400> 1
gtcaccatat tcttgggaac aagatctaca gcatgggca gaattttcc accagaatc 60
ctctgggatt cttcccgac caccagttgg atccagcctt cagagcaaac accgcaaattc 120
cagattggga cttcaatccc aacaaggaca cttggccaga cgccaaacaag gttaggagctg 180
gagcatcggt gctgggttcc accccacccgc acggaggcc ttgggggtgg agccc 235

<210> 2

<211> 197

<212> DNA

<213> HBV

<220>

<221> gene

<222> (1)..(197)

<223> Beta- element of HBV

<400> 2
gcatggagac caccgtgaac gcccacccaa tattgccaa ggtcttacat aagaggactc 60
ttggactctc aqcaatgtca acgaccgacc ttgaggcata cttcaaaagac tgtttgtta 120
aagactggga ggagttgggg gaggagatta ggttaaagggt ctttgacta ggaggctgta 180
ggcataaaatt ggtctgc 197

<210> 3

<211> 8007

<212> DNA

<213> HBV

<220>

<221> gene

<222> (1)...(8007)
<223> Prototype vector of HBV

<400>	3		
aacttttca	cctctgccta atcatcttctt	gttcatgtcc tactgttcaa gcctccaagc	60
tgtgccttgg	gtggccttgg ggcatgaca tcgaccctta	taaagaattt ggagctacty	120
tggagttact	ctcgtttttg ctttctgact tcttccttc	agtacgagat cttagatata	180
ccgcctcagc	tctgtatcgga	aaaggccttag agtctcttgca	240
ctgcaactcg	gcaagcaattt	cttgcgtggg gggactaat	300
gtgttaattt	ggaagatcca	gcgtctagag accttagtgc	360
tgggcctaaa	gttcaggcaa	ctttgtgtt ttcacatttc	420
aaacagttat	agatgttttgc	gagtggtggat tgcactctt ccagttata	480
gaccacaaa	tgccttatac	ctatcaacac ttccggagac	540
gcagggtcccc	tagaagaaga	actccctcgc ctgcgcagac	600
gcagaagatc	tcaatctcg	aatctcaat gttagtatcc	660
aactttactg	ggctttatcc	ttctactgtt cctgtcttta	720
tcttttcata	ataatacattt	acaccaagac attatcaaaa	780
ccactcacag	ttaatgagaa	aatgtgaaca ttgttgc	840
aagggttacca	aatatttacc	tttgcgttttta atccctatttgc	900
gttaatcatt	acttccaaac	tttgcgttttgc	960
tataagagag	aaacaacaca	tttgcgttttgc	1020
gatctacagc	atggggcaga	tttgcgttttgc	1080
ccagtttgc	ccagccctca	tttgcgttttgc	1140
caaggacacc	tttgcgttttgc	tttgcgttttgc	1200
cccacccgcac	tttgcgttttgc	tttgcgttttgc	1260
gccagcaaat	cegcctctg	tttgcgttttgc	1320
gtctccacct	tttgcgttttgc	tttgcgttttgc	1380
ccaaactctg	caagatccca	tttgcgttttgc	1440
aggaacagta	tttgcgttttgc	tttgcgttttgc	1500
tggggaccct	tttgcgttttgc	tttgcgttttgc	1560
gttacaggcg	tttgcgttttgc	tttgcgttttgc	1620
gtgggtggact	tttgcgttttgc	tttgcgttttgc	1680
gtcccccaacc	tccaaatcact	tttgcgttttgc	1740

gatgtgtctg	cggcgttta	tcatcttct	cttcatactc	ctgttatgtcc	tcatcttctt	1800
gttgttctt	ctggactatac	aaggatgtt	gcgcgttgc	ccttaattc	caggatctc	1860
acaaccagc	acgggacat	gcggacatc	catgactact	getcaaggaa	cctctatgt	1920
tccctctgt	tgctgtacca	aacctcgg	cgaaaattgc	acctgtattc	ccatccccatc	1980
atcctgggct	ttcggaaaaat	tcctatgg	gtgggctca	gccgcgttct	cctggctcag	2040
tttactatgt	ccatgttgc	atgggttcgt	aggggtttcc	cccactgttt	ggcttcagt	2100
tatatggatg	atgtggatt	ggggggcaag	tctgtacage	atcttgatc	ccttttacc	2160
gtgttacca	atttctttt	gtctttgggt	atacatttaa	accctaaca	aacaagaga	2220
ttgggttact	ctcttaattt	tatgggttat	gtcatttgc	gttatgggtc	cttgccacaa	2280
gaacacatca	tacaaaaaaat	caaagaatgt	tttagaaaaac	tccctttaaa	caggcctatt	2340
gattggaaag	tatgtcaacg	atttgggtt	ctttgggtt	ttgtgtcccc	ttttcacaaa	2400
tgtgttatac	ctgcgttgat	gcctttgtat	gtatgtattc	aatctaaca	ggctttact	2460
ttctcgccaa	cttacaaggc	ctttctgtgt	aaacaatacc	tgaacccat	ccccgttgcc	2520
cgccaaacggc	caggctgtg	ccaagtttt	gctgacgca	cccccaactgg	ctggggcttg	2580
gtcatggccc	atcaagcgat	gctgtggaaacc	ttttggctc	ctctgtccat	ccataactcg	2640
gaactcttag	ccgcttgc	tgcgtcgacg	aggctgtgg	caaacattat	cgggactgtat	2700
aactctgttgc	tcctatccgg	caaataataca	tgtttccat	ggctgtctagg	ctgtgtcgcc	2760
aactggatcc	tcgcgggac	gtcccttgc	tacgttccgt	cgccgtgaa	tcctgcccac	2820
gacccttctc	gggggtcgctt	gggactctct	cgcccccttc	tccgtctgc	gttccgaccg	2880
accacggggc	gcacccctct	ttacggggac	tcccccgtct	tgccttctca	tctgcccac	2940
cgtgtgcact	tcgccttacc	tctgcacgtc	gcatggagac	caccgtgaa	gccccacaaa	3000
tattgtccaa	ggtcttacat	aagaggactc	ttggacttcc	agaatgtca	acgaccgacc	3060
ttgaggcata	cttcaaaagac	tgtttgttta	aagactggg	ggagttgggg	gaggagatta	3120
ggttaaaggt	ctttgtacta	ggaggctgt	ggcataaaat	ggctgtcgca	ccagcaccat	3180
gcaacttttt	cacccctctc	taatcatctc	ttgttcatgt	ctactgttc	aagcctccaa	3240
gctgtgcctt	gggtggcttt	ggggcatgga	catacgccct	tataaagaat	ttggagactac	3300
tgtggagtt	ctctcgcccc	tgccttctga	cttctttctc	tcagtagc	atcttcttaga	3360
ggggccctatt	ctatagtg	acctaataatgc	tagaggatc	ttgtgtggaa	accttacttc	3420
tgtgggtgt	cataattgg	caaactacact	acagagatt	aaagctctaa	ggtaaatata	3480
aaatttttaa	gtgtataatg	tgttaaaacta	ctgattctaa	ttgtttgtgt	attttagatt	3540
ccaacctatg	gaactgtatg	atgggagcag	ttgtgtggaa	cctttatgt	ggaaaaacctg	3600
ttttgctcag	aagaatgtcc	atctgtgtat	gtatggacta	ctgcgtactc	tcaacattct	3660

actcctccaa	aaaagaagag	aaaggtagaa	gaccccaagg	actttccttc	agaattgcta	3720
agttttttga	gtcatgctgt	gtttagtaat	agaactcttg	cttgctttgc	tattnacacc	3780
acaaggaaaa	aagctgcact	gctatacaag	aaaattatgg	aaaatattt	gatgtatagt	3840
gccttgacta	gagatcataa	ttagccatac	cacatttgta	gagggtttac	ttgctttaaa	3900
aacacctcca	cacccccc	tgaacccctgaa	acataaaatg	aatgcaattg	ttgttgtttaa	3960
cttgcatttt	gcagcttata	atggttcacaa	ataaaagcaat	agcatcacaa	atttcacaaa	4020
ttaaggcattt	ttttcactgc	atcttagttg	tggtttgtcc	aaactcatca	atgtatctta	4080
tcatgtctgg	atcatcccg	catggatatac	acgccccat	tcttatttaca	gttagggacct	4140
cttcgttgtg	taggttccgc	tgtatcccta	ggggaaatag	agaggcacct	tgaactgtct	4200
gcatcagcca	tatagcccc	gctgttgcac	ttacaaacac	aggcacagta	ctgacaaacc	4260
catacacctc	ctctgaaata	cccatagttg	cttagggctgt	ctccgaactc	attacaccct	4320
ccaaagtctag	agctgtatatt	tgcgcataa	gggcagcgag	ggctcttcca	gataaaatag	4380
cttctgccga	gagtcccgta	aggtagaca	cttcagcttaa	tccctcgatg	agggtctacta	4440
gaatagtctag	tgccggtcccc	attttggaaaa	ttcacttact	tgatctatc	cagaagatgg	4500
cgaggggcct	ccaacacagt	attttcctc	ccgactctta	aaatagaaaa	tgtcaagtca	4560
gttaaggcagg	aagtggacta	actgacgcag	ctggccgtgc	gacatctct	tttatttagt	4620
tgcttaggcaa	cgcgcctccag	aggcgctgtg	gttttgcag	aggaagaaa	agccttcca	4680
cccaaggccta	gaatgtttcc	acccaaatcat	tactatgaca	acagctgttt	tttttagtat	4740
taagcagagg	ccggggaccc	ctggccggc	ccgcttaact	tgagaaaaaa	gaagagaggc	4800
atgttagagg	cttcccgagg	caacttgtca	aaacaggact	gctttatatt	ctgtcacact	4860
gtctggccct	gtcacaagg	ccagcacctc	cataccccc	ttaataagca	gtttggaaac	4920
gggtgcgggt	cttactccgc	ccatcccgcc	cctaactccg	cccaagttccg	cccatcttcc	4980
gccccatggc	tgactaattt	tttttattta	tgcaagggcc	gaggccgcct	cgccctctga	5040
gctattccag	aagttagttag	gaggctttt	tgaggcccta	ggctttgc	aaaagctaat	5100
tcggcgtat	ctgctgcttg	caaacaaaaa	aaccacccgt	accaggctgt	gttttgttgc	5160
cggtatcaaga	gctaccact	cttttccga	aggtaactgg	cttcagcaga	gcccagatac	5220
caaatactgt	ctttctatgt	tagccgtatg	taggcccacca	cttcaagaac	tctgtacac	5280
cgctatcata	cctcgctctg	ctaatccgt	taccaggcgc	tgctgcccagt	ggcgataagt	5340
cgtgtcttac	cgggttggac	tcaagacgt	agttaccggta	taaggcgcag	cggtcgccgt	5400
gaacgggggg	ttcgtgcaca	cagcccgact	tggagcgaac	gacctacacc	gaactgagat	5460
acctacagcg	tgtagcattga	gaaagcgcca	cgcttcccg	agggaaaag	cgccgacaggt	5520

atcccgtaag	cggcagggtc	ggaacaggag	agegcacagg	ggagcttcca	ggggaaacg	5580
cctggtatct	ttatagtctt	gtcggttttc	gccacctctg	acttgagcgt	cgattttgt	5640
gatgctcgtc	agggggccgg	agccatgtta	aaaacgcag	caacgcaga	tagcttctag	5700
ctagaaatttgc	taaacgtta	tatttgtta	aaattcgct	taaatttttg	ttaaatcagc	5760
tcattttta	accaataggc	cgaaatccgc	aaaatccctt	ataaatcaa	agaatagccc	5820
gagataggg	tgagtgttgt	tccagtttgg	aacaagagtc	cactattaaa	gaacgtggac	5880
tccaaacgtca	aaggcgaaa	accgtctat	caggcgatg	gcccact	acgtgaacca	5940
tcacccaaat	caagttttt	ggggtcgagg	tgccgttaaag	cactaaatcg	gaacctaaaa	6000
gggagcccc	gatttagagc	ttaacgggaa	aagcccgca	acgtggcag	aaaggaaggg	6060
aagaaagcga	aaggagcggg	cgctaggcg	ctggcaagt	tagcgtcac	gtcgccgt	6120
accaccacac	ccggccgct	taatgcggc	ctacaggcg	cgtactatgg	ttgctttgac	6180
gagaccgtat	aacgtgtttt	cctcggttga	atcagcgcc	gagctaaaca	ggggccgat	6240
taaagggatt	ttagacagga	acgtgtacgc	agttggatta	ccaaaggccc	tcgtgtatcg	6300
cctattttta	taggttaatg	tcatgataat	aatggtttct	tagacgtcg	gtggcacttt	6360
tcggggaaat	gtgcgcggaa	cccttatgg	tttatttttc	taatatacatt	caaataatgt	6420
tccgctcatg	agacaataac	cctgtataat	gttcataaa	tattggaaaa	ggaagagtat	6480
gagtttcaaa	cattttccgt	tcgccttat	tcctttttt	goggcat	tttgcctgt	6540
ttttgtctac	ccagaaacgc	tggtaaaatg	aaaagatgt	gaagatcgt	tgggtgcacg	6600
agtgggttac	atcgaactgg	atctcaacag	cggtaagatc	cttggagat	ttgcggccga	6660
agaacgtttt	ccaatgtat	gcactttaa	agttctgt	tgtggcgcgg	tattatcccg	6720
tgttgacgccc	ggcacaagagc	aactcggtcg	ccgcatacac	tatttcaga	atgacttgg	6780
tgagttactca	ccagtcacag	aaaagatct	tacggatggc	atgacagta	gagaattatg	6840
cagtgtcgcc	ataaccatga	gtgataaac	tgccgccaac	ttacttctga	caacgcategg	6900
aggaccgaag	gagctaacc	cttttttgc	caacatgggg	gatcatgtaa	ctgccttga	6960
tcgttggaa	ccggagctga	atgaagccat	acccaaacgc	gagcgtgaca	ccacgatgc	7020
tgcagcaatg	gcaacaacgt	tgcgcaaaact	attaactggc	gaactactt	ctctagctt	7080
ccggcaacaa	ttaatagact	ggatggggc	ggataaaatg	gcaggaccac	ttctcgctc	7140
ggcccttcgg	gtcggtctgt	ttattgttgc	taatcttgc	gcccgttgc	ttgggtctcg	7200
cgggtatcatt	gcagcactgg	ggcccgatgg	taaggcccttcc	cgtatctgt	ttatcttacac	7260
gacggggagt	caggcaacta	tggatgaac	aaatagacag	atcgctgaga	taggtgcctc	7320
actgattaag	cattttgttac	tgtcgaccca	agtttactca	tatatacttt	agattgtt	7380
aaaacttcat	ttttatgtt	tctagcgct	tgacattgt	tattgtact	ttaataatag	7440

taatcaatta	cgggtcatt	agttcatagc	ccatatatgg	agtccgcgt	tacataactt	7500
acggtaaatg	gccccctgg	ctgaccggcc	aacgacccc	gcccattgc	gtcaataatg	7560
acgtatgttc	ccatagtaac	gccaataggg	acttccatt	gacgtcaatg	ggtgactat	7620
ttacggtaaa	ctgccccactt	ggcagtagat	caagtgtatc	atatgccaag	tacgccccct	7680
attgacgtca	atgacggtaa	atggcccgcc	tggcattatg	cccgatcat	gacccatgg	7740
gactttccct	cttggcagta	catctacgt	ttatgtatcg	cttattaccat	ggtgatgcgg	7800
ttttggcagt	acatcaatgg	gggtggatag	cgttttgact	cacggggatt	tccaaatctc	7860
cacccattt	acgtcaatgg	gaggttttt	tggcacaaa	atcaacggga	ctttccaaaa	7920
tgtcgtaaca	actccgcccc	attgacgaa	atggggcgt	ggcggttacg	gtggggaggtc	7980
tatataagca	gagctctctg	gctaact				8007

<210> 4
<211> 8717
<212> DNA
<213> Artificial Sequence

<220>
<223> R711: pCMV-HBV/GFP Full Sequence

<400> 4	aactttttca	cctctgceta	atcatcttt	gttcatgtcc	tactgttcaa	gcctccaagc	60
	tgtgccttgg	gtggctttgg	ggcatggaca	tcgaccctta	taaagaattt	ggagctactg	120
	tggagttact	ctcgtttttg	ccttctgact	tettcccttc	agtacgagat	cttctagata	180
	ccgcctcage	tctgtatcg	gaaggcttag	agtctccctga	gatgttca	cctcaccata	240
	ctgcactcg	gcaagcaatt	cttgcgtgg	ggaaactaat	gactcttagt	acctgggtgg	300
	gtgttaattt	ggaagatcca	ggctcttagag	accttgtatg	cagttagtgc	aacactaata	360
	tggccttaaa	gttcaggcaa	ctcttgcgtt	ttcacattt	ttgtctctat	tttggaaagag	420
	aaacagttat	agagtatttg	gtgttttcg	gagtgtggat	tcgcactct	ccagcttata	480
	gaccacaaa	tgccttatac	ctatcacac	tttccggagac	tactgttgtt	agacgacgag	540
	gcagggtcccc	tagaagaaga	actccctcgc	ctcgccagac	aaggctcaa	tcggccgcgtc	600
	gcagaagatc	tcaatctcg	gaatctcaat	gttagtattt	cttggactca	taagggtgggg	660
	aactttactg	ggctttattt	tttctactgtt	cctgtttata	atcccttattt	gaaaacacca	720
	tcttttctta	ataatacattt	acaccaagac	attatcaaaa	aatgtgaaca	gtttgttagc	780
	ccactcacag	ttaatgtgaaa	aagaagattt	caattgttata	tgcctggcag	gttttatcca	840
	aaggttacca	aatatattacc	attggataag	ggtattaaac	tttattatcc	agaacatcta	900
	gttaatcatt	acttccaaac	tagacactt	ttacacactt	tatggaaaggc	gggttatatta	960

tataagagag	aaacaacaca	tagccctca	ttttgtggg	caccatattc	ttggaaaca	1020
gatctacagc	atggggcaga	atctttccac	cagcaatct	ctgggattt	ttcccgacca	1080
ccagttggat	ccagccctta	gagcaaacac	cgaatcca	gattgggact	tcaatccaa	1140
caaggacacc	tgcccacagc	ccacaaggt	aggagctgga	gcattggc	tggttccac	1200
cccacccgac	ggaggccttt	tggggtggag	ccctcaggct	cagggcatac	tacaaactt	1260
gccagcaaat	ccgcctctg	cctccacca	tcggcagtca	ggaaggcagc	ctaccccgct	1320
gtctccacct	ttgagaaaaca	ctcatcctca	ggagatgagt	aaaggagaag	aactttcac	1380
tggagttgtc	ccaattcttgc	ttgaatttga	ttgtgtatgtt	aatggcaca	aatttttgtt	1440
cagtggagag	ggtaaggtt	atgcaacata	cggaaaactt	acccttaat	ttatggcact	1500
tactggaaaa	ctacatgttc	catggccaaac	acttgtact	actttcttt	atgggttca	1560
atgctttca	agataccccat	atcatatgaa	acacatgac	tttttcaaga	gtgcctatgc	1620
cgaaggttat	gtacaggaaa	gaactatattt	tttcaagat	gacgggaaact	acaagacacg	1680
tgctgaagtc	aagttttaag	gtgataccct	tgtaataga	atcgagttaa	aaggatttga	1740
ttttaaagaa	gatggaaaca	ttcttggaca	caaatttggaa	tacaactata	actcacacaa	1800
tgtatacatc	atggcagaca	aacaaaagaa	tggaatcaa	gttaacttca	aaatttagaca	1860
caacattgaa	gatggaaagc	ttcaactagc	agabcttatt	caacaaaata	ctccaaatgg	1920
cgatggccct	gtccttttac	cagacaacca	ttacctgtcc	acacaatctg	ccctttcgaa	1980
agatccaaac	gaaaagagag	accacatgg	ctttttgag	ttttaacag	ctgtggat	2040
tacacatggc	atggatgaac	tatacaaata	aggaattcca	caacccctca	ccaaactctg	2100
caagatccca	gagtggaggg	cctgttattt	cctgtgttgc	gtccaggttc	aggaacacgt	2160
aacctgttc	tgactactgc	cttcccttca	tgcgcaatct	tctcgaggat	ttggggaccc	2220
gctgtgaaca	ttggagaacat	cacatcaggaa	ttctttaggc	ccctttctgt	gttacaggcg	2280
gggtttttct	ttgttgcac	aatcttcaca	ataccgcaga	gtcttagact	gtgggtggact	2340
tctctcaatt	ttcttaggggg	aactaccgtg	tggttgc	aaaatctca	gtccccaacc	2400
tccaaatcaet	caccaacactc	ttgttcttca	acttgtctg	gttacatctg	gtatgtctg	2460
cgcgctttta	tcatcttctt	cttcattctg	ctgtatgcc	tcatctttt	gttgggttctt	2520
ctggactatac	aaggatgttt	gcccgtttgt	cctctaattt	caggatctc	acacaaccacg	2580
acgggacat	gcccggacat	ctgactact	gtcaaggaa	cctctatgtt	tccctctctgt	2640
tgtgttacca	aaccttccgaa	cgaaatttgc	acctgttattc	ccatccatc	atctgggct	2700
ttcgaaaaat	ttcttatggaa	ttggggctca	gcccgtttct	ctgtgttgc	ttatctactgt	2760
ccattttgttc	atgggttctgt	agggctttcc	ccactgtttt	ggcttccatgt	tatatggat	2820

atgtggatt	gggggccaag	tctgtacage	atcttgagtc	ccttttacc	gctgttacca	2880
attttcttt	gtctttgggt	atacatttaa	acccataaca	aacaagaga	tggggttact	2940
ctotaaattt	tatgggttat	gtcattggat	gttatgggtc	cttgccacaa	gaacacatca	3000
tacaaaaaat	caaagaatgt	tttagaaaac	ttcctattaa	caggcctatt	gattggaaag	3060
atatgtcaac	aattgtgggt	ctttgggtt	ttgctgcccc	tttacacaa	tgtggttatc	3120
ctgcgttcat	gcctttgtat	gcatgttattc	aatctaagca	ggcttcaact	ttctcgccaa	3180
cttacaaggc	cttctgtgt	aaacaatacc	tgaacctta	ccccgttgcc	cggcaacggc	3240
caggctctgt	ccaagtgtt	gctgacgca	cccccaactgg	ctggggcttgc	gtcatgggcc	3300
atcagcgcatt	gcgttggaaacc	ttttccggctc	ctctgcgcatt	ccatactcg	gaactcttag	3360
ccgcgttgc	tgctcgcagc	aatgttggag	caaacattat	cgggactgtat	aactctgttgc	3420
ttctatcccg	caaataataca	tcgttccat	ggctgttgc	tagtgcgttgc	aactggatcc	3480
tgcgccggac	gtctttgtt	tacgccccgt	cgccgcgtgaa	tcctggggac	gacccttctc	3540
ggggtcgtt	gggactctct	cgcccccttc	tcggctgtcc	gttccgcacgg	accacggggc	3600
gcacccctctt	ttacgcggac	tcccccgtctg	tgcccttcata	tctggggac	cgtgtcact	3660
tcgttccacc	tctgcacgtc	gcatggagac	caccgtgaa	gccccacaaa	tattggccaa	3720
ggtcttacat	aaggaggactc	ttggactttc	agaatgtca	acgacccgacc	ttgaggcata	3780
cttcaaaagac	tggtttgtta	aaagactggg	ggagttgggg	gaggagatta	ggttaaaggt	3840
ctttgtacta	gggggtgtat	gcaataaattt	ggctgtcgca	ccagcacccat	gcaacttttt	3900
cacccctctcc	taatcatctc	ttgttcatgt	cctactgttgc	aaagctccaa	gctgtgcctt	3960
gggtggctt	ggggcatgga	catgcaccc	tataaaagat	ttggaggtac	tgtggagtt	4020
ctctcggttt	tgcccttctg	cttctttctt	tcagactcg	atctctaga	gggccttatt	4080
ctatagtgtc	acccataatgc	taaggatctt	ttgtgaagga	acccatctt	tgtgggtgt	4140
cataattgg	caaactactt	acagagat	aaagctctaa	ggtaaatata	aaatttttaa	4200
gtgtataatg	tgttaaacta	ctgattctaa	ttgtttgtt	attttagatt	ccaacctatg	4260
gaactgtat	atggggacag	ttgggaaatg	cctttaatga	ggaaaacctg	ttttgtcg	4320
aagaaatgcc	atctgtgtat	gatggggcta	ctgctgactc	tcaacattct	actccctcaa	4380
aaaagaagag	aaaggtagaa	gaccggcaagg	actttccctt	agaattgtat	agtttttta	4440
gtcatgttgt	gtttagataat	agaactcttg	cttgcgttgc	tatttacacc	acaaaggaaa	4500
aagctgtact	gctatacaag	aaaattatgg	aaaatattt	gatgtatagt	gccttgacta	4560
gagatcataa	tccggcatac	cacatttgc	gaggtttac	ttgtttaaa	aaaccccca	4620
cacccccc	tgaacctgaa	acataaaaatg	aatgtcaattg	ttgttttaa	cttgcattt	4680
gcagcttata	atggttacaa	ataaagcaat	agcatcacaa	atttcacaaa	taaagcattt	4740

ttttca	tgc	tttctatgttg	ttgtttgtcc	aaactcatca	atgtatctta	tcatgtctgg	4800	
atcatcccgc	c	atgttatca	acgccccattt	tctat	tttca	gttgggac	cttcgttgt	4860
taggtaccgc	tgtat	ttcttca	gggaaatagt	agaggcac	tgaactgtct	gcatacagca	4920	
tatagcccc	cc	gtgttcgac	ttacaacac	aggcacagta	ctgacaa	acc	catacac	4980
ctctgaata	cc	catatgtt	cttagggctgt	ctccga	actc	acc	cttca	5040
agctgtattt	tcg	ccatcaa	gggcagcgag	ggcttctca	gataaaatag	cttctgc	gca	5100
gagtcccgta	agg	gtt	tttgcaga	ttcagctaa	tcctcgat	agg	ctacta	5160
tgccgc	ttt	tttgc	tttgc	tttgc	tttgc	tttgc	tttgc	5220
cca	acac	atgtt	cc	atgtt	cc	atgtt	cc	5280
aagtggacta	act	gtac	gc	cg	tc	gac	tc	5340
cgcc	cc	cc	cc	cc	cc	cc	cc	5400
gaatgtttcc	acc	cc	cc	cc	cc	cc	cc	5460
ccggg	ggg	ggg	ggg	ggg	ggg	ggg	ggg	5520
cttcc	cc	cc	cc	cc	cc	cc	cc	5580
gtcaca	agg	cc	ac	cc	at	cc	cc	5640
cttact	cc	cc	cc	cc	cc	cc	cc	5700
tgacta	attt	ttt	ttt	ttt	ttt	ttt	ttt	5760
aagt	atgt	tttt	tttt	tttt	tttt	tttt	tttt	5820
ctgct	gtct	tttt	tttt	tttt	tttt	tttt	tttt	5880
gcttac	cc	cc	cc	cc	cc	cc	cc	5940
ccttct	atgt	tttt	tttt	tttt	tttt	tttt	tttt	6000
cctc	cg	cc	cc	cc	cc	cc	cc	6060
cgggtt	gg	gg	gg	gg	gg	gg	gg	6120
ttcgt	tc	ta	ac	cc	cc	cc	cc	6180
tgac	cc	cc	cc	cc	cc	cc	cc	6240
tgac	at	tt	tt	tt	tt	tt	tt	6300
ttat	atgt	ttt	ttt	ttt	ttt	ttt	ttt	6360
aggggg	gg	gg	gg	gg	gg	gg	gg	6420
taaa	acgtt	ttt	ttt	ttt	ttt	ttt	ttt	6480
acca	atag	cc	cc	cc	cc	cc	cc	6540
tgag	gtt	ttt	ttt	ttt	ttt	ttt	ttt	6600

aagggcgaaa aaccgtctat cagggcgatg gcegcggact acgtgaacca tcacccaaat	6660
caagttttt ggggtcgagg tgccgtaaag cactaaatcg gaaccctaaa gggggcccc	6720
gatttagcgc ttgacgggaa aagccggcga acgtggcgag aaaggaaggg aagaaggcga	6780
aaggagccgg cgcttagggc ctggcaagtg tagcggtcac gctgcgcgta accaccacac	6840
ccggccgcgt taatgcggc ctacaggcg cgtaatcg tggcttgc gagaccgtat	6900
aacgtgcgtt cctcggttga atcagagcg gactaaaca ggaggccgt taaaggatt	6960
ttagacagga acgttacgac agctggatta ccaaaaggcc tcgtgtatacg cctatTTTA	7020
taggttaatg tcatgtataat atggtttct tagacgttag gtggcactt tcggggaaat	7080
gtgcgcggaa cccttatttgc ttatTTTC taatataccat caaatatgtt cccgcgtatg	7140
agacaataaac cctgtataat gcttcaataa tattaaaaaa ggaagaggtat gagtattcaa	7200
catttccgtg tggcccttat tccctttttt gggcattttt gccttcgtt ttttgcac	7260
ccagaaacgc tggtaaagg aaaaatgtt gaaatcgtt tgggtgcacg agtgggttac	7320
atcgaactgg atctcaacag cggtaagatc ctggagatg ttggcccgaa agaacgtttt	7380
ccaaatgtga gcacTTAA aatTCGCTA ttggcgccg tattatccc ttgttgcac	7440
ggcaagagc aactcggtcg ccgcatacac tatttcaga atgacttggt tgagtactca	7500
ccagtcacag aaaacatct tacggatggc atgacgtt gagaattatg cagtgtgcc	7560
ataaccatgtt gtgataacac tgccggcaac ttatctgtt caacgttgg aggaccgaag	7620
gagctaaccg ctttttgttca acatgggg gatcatgtt ctcgccttgc tcgttggaa	7680
ccggagctga atgaagccat accaaacgc gaggctgaca ccacgttgc tgcaatgt	7740
gcaacaacgt tgccaaact attaactggc gaactacttta ctctgtttt ccggcaacaa	7800
ttaatagact ggatggggc ggataaagg ttgcaggaccat ttctgcgtt ggccttcg	7860
gctggctgtt ttatgttgc taatcttgc gcccgttgc gtgggttgc cggtatcatt	7920
gcagcactgg ggccagatgg taagccctcc cgtatctgtt ttatcttacac gacggggagt	7980
caggcaacta tggatgaacaaatagacag atcgttgcata taggtgcctt actgtttaaa	8040
catttgcgttac tggatgttgc acatgggg gatcatgtt ctcgccttgc tcgttggaa	8100
ttttttttttc tctatgttgc ttatgttgc tttttttttt tttttttttt tttttttttt	8160
cgccgttattt atggatgttgc tttttttttt tttttttttt tttttttttt tttttttttt	8220
ggccgttattt atggatgttgc tttttttttt tttttttttt tttttttttt tttttttttt	8280
ccatgttgcgtt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt	8340
ctggccactt ggcgttattt atggatgttgc tttttttttt tttttttttt tttttttttt	8400
atggatgttgc tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt	8460
cttggcgtt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt	8520

acatcaatgg cgctggatag cggtttgact cacggggatt tccaaagtctc cacccattg 8580
acgtcaatgg gagtttggttt tggcacaaa atcaacggaa ctttccaaaa tgctgtaaca 8640
actccgcccc attgacgaa atggcggtt ggcgtgtacg gtgggaggct tatataagca 8700
gagctctctg gctaact 8717

<210> 5
<211> 7991
<212> DNA
<213> Artificial Sequence

<220>
<223> R712: pCMV-HBV/GFP3.2 Full Sequence

<400> 5
aacttttca cctctgccta atcatctttt gttcatgtcc tactgttcaa gcctccaagc 60
tgtgccttgg gtggctttgg ggcattggaca tcgaccctta taaaagaattt ggagctactg 120
tggagttact ctogtttttgc ttctctgact ttcttccttc agtacgagat ctcttagata 180
ccgcctcagc tctgtatcgga gaagccttag agtctccctga gcattgttca cctcaccata 240
ctgcacttag gcaagcaattt ctttgttggg gggactaatgactcttagt acctgggtgg 300
gtgttaattt ggaagatcca ggcgttagag accttagtagt cagtatgtc aacactata 360
tgggcctaaa gttcaggcaaa ctcttgggtt ttcacatttc ttgttcaact tttggaaagag 420
aaacagtttat agatgttttg gtgttttgcg gagggttggat tggcactctt ccagcttata 480
gaccacaaa tgccccttata ctatcaacac ttccggagac tactgttggt agacgacgag 540
gcagggtcccc tagaagaaga actccctcgcc tcgcgcagac aaggctcaa tcgcgcgtc 600
gcagaagatc tcaatctcgga aatctcaat gtttagtattt ctggactca taagggtggg 660
aactttactg ggcttttattt ttctactgtt cttgttttta atccctattt gaaaacacca 720
tcttttccata atatacatttt acaccaagac attatcaaaa aatgtgaaaca gtttttagggc 780
ccactcacaatc ttaatgtggaaa aagaagatgg caatttggat tgcctggccag gttttatcca 840
aagggttacca aatatttacc attggataag ggtttaaaac ctatttattcc agaacatcta 900
gttataatcattt acttccaaac tagacactat ttacacactt tatggaaaggc gggatattttt 960
tataagagag aaaaacacaca tagcgcctca ttttgggtt cccatattt ttggggacaaa 1020
gatctacacgc atggggcaga atctttccac cagcaatctt ctggattttt ttcccgacca 1080
ccagttggat ccaggcttca gggcaacac cggaaatccaa gttttggact tcaatccaa 1140
caaggacacc tggccagacg ccaacaaggtt aggagctggaa gcatttgggc tgggttccac 1200
cccacccgcac ggaggccctttt tgggggtggag ccctcaggctt caggccatac tacaaaacttt 1260
ggcaggcaat ccgcctctg cttccacca tggccgtca ggaaggccgc ctaccccgct 1320

gtctccacct	ttgagaaaca	ctcatcctca	ggagatgagt	aaaggagaag	aactttcac	1380
tggagttgtc	ccaattctt	ttgaattaga	tggtgatgtt	aatgggcaca	aattttctgt	1440
cagtggagag	ggtaagggt	atgcaacata	cgaaaactt	acccttaat	ttatggcac	1500
tactggaaaa	ctacccgttc	catggccaa	acttgtact	actttctt	atgggtgtca	1560
atgcctttca	agataccccag	atcatatgaa	acagcatgac	ttttcaaga	gtgccatgcc	1620
cgaagggttat	gtcagggaaa	gaactatatt	tttcaaagat	gacgggaa	actacaagacg	1680
tgctgaagtc	aagtttgaag	gtgataccct	tgttaataga	atcgagttaa	aaggtagttga	1740
ttttaaagaa	gatggaaaca	ttcttggaca	caaattggaa	tacaactata	actcacacaa	1800
tgtatatac	atggcagaca	aacaaaagaa	tgaaatcaaa	gttaacttca	aaatttagaca	1860
caacattgaa	gatggaaagcg	ttcaactagc	agaccattat	caacaaaata	ctccaattgg	1920
cgtatggccct	gtccttttac	cagacaacca	ttacccgttc	acacaatctg	ccctttcgaa	1980
agatcccaac	gaaaagagag	accacatgtt	ccttcttgag	tttgcatacag	ctgtgggat	2040
tacacatggc	atggatgaac	tatacaaata	agaaatttt	cagtttatatg	gatgtgtgg	2100
tattggggc	caagtctgt	cagcatctt	agtcctttt	taccgcgtt	accatatttc	2160
ttttgtctt	gggtatacat	ttaaacccta	acaaaacaaa	gagatgggg	tactctctaa	2220
attttatgg	ttatgtcatt	ggatgttatg	ggcttcttg	acaagaacac	atcatacaaa	2280
aaatcaaaga	atgttttaga	aaacttctta	ttaacaggcc	tattgttgg	aaagtatgtc	2340
aacgaattt	gggtttttt	ggttttgtg	cccccatttac	acaatgtgtt	tatcctcggt	2400
tgatgcctt	tgatgcatt	attcaatcta	acgaggcttt	cacttctcg	ccaaacttaca	2460
aggcctttct	gtgtaaacaa	tacctgaacc	tttacccctg	tgcccgca	cggccaggtc	2520
tgtgccaagt	gtttgtgac	gcaaaaaaaaa	ctggctgggg	cttggtcatg	ggccatcagc	2580
gcatgcgtgg	aaccttttcg	gtccctctgc	cgatccatac	tgccgaaactc	ctagccgtt	2640
gttttgcgtc	cagcaggct	ggagcaaaaca	ttatcgggac	tgataactct	gttgccttat	2700
cccgaaata	tacatcgttt	ccatggctgc	taggcgtgc	tgccaaactgg	atccctgcgc	2760
ggacgtcctt	tgtttacgtc	cctgtggcgc	tgaatcttcg	ggacgaccc	tcccggggtc	2820
gcttggact	ctctcgtccc	cttctccgtc	tgccgttccg	acccgaccacg	ggccgcaccc	2880
ctctttacgc	ggactccccc	tctgtgcctt	ctcatctgc	ggaccgtgt	cacttcgtt	2940
cacccctgc	cgtcgcatgg	agaccacccgt	gaacggccac	caaattattgc	ccaaaggctt	3000
acataagagg	actcttggac	tctcgaat	gtcaacggacc	gaccctgagg	cataacttca	3060
agactgttt	tttaaagact	ggggaggagtt	ggggggaggag	attaggttaa	aggcttttgt	3120
actaggaggc	tgttaggcata	aattggtctg	cgcaccagca	ccatgcact	ttttcacctc	3180

cttgc当地 aaaaaaccac cgcttaccagg ggtgggttgt ttgccgatc aagagctacc	5160
aactctttt cc当地 aggttaa ctggcttc当地 cagagc当地 cag ataccaata ctgtcttct	5220
agttagccg tagttaggcc accatctcaa gaactctgtc gc当地 cgc当地 catacctcg	5280
tctgctaaatc ctgttaccagg tggctgtgc cagtgccgat aagtctgtc ttacccgggt	5340
ggactctaaaga c当地 agttagttac cggataaggc gc当地 cggctc ggctgaacgg ggggtctgt	5400
cacacagccc agcttggagc gaacgaccta caccgaaactg agataacctac agcgtgagca	5460
ttgagaaaagg gccacgcttc cccgaaaggag aaaggcggac aggtatccgg taagcggcag	5520
ggtc当地 aaca ggagagc当地 cggaggagct tccaggggga aacgc当地 ctgt atctttatag	5580
tccctgtcggg tttcgccacc tctgacttgc gc当地 ctgtcattt ttgtatgtc cgtcagggg	5640
gc当地 gagcctta tgaaaaaacg cc当地 gagc当地 aactgactt ctgactgaa attgtaaacg	5700
tttaatattttt gt当地 aaatttcc gctgttaat ttgttaat cagtc当地 tttaaaccat	5760
aggccgaaat cggc当地 aaatc ctttataat caaaagataa gccc当地 gagata gggttgagtg	5820
ttgttccagttt ggagacaag agtccactat taaaagacgt ggc当地 ac acgtc当地 aac gt当地 aaaggc	5880
gaaaaacccgt ctatcaggc当地 gatggccgccc cactacgtc accatcaccc aaatcaagtt	5940
ttttggggcc gagggtccgt aaaaactactaa atcggaaacc taaaaggagc ccccgattta	6000
gagcttgc当地 gggaaaggc当地 cggcaacgtgg cggaaaaggag aggaaaggaaa gggaaaggag	6060
cgggc当地 tag ggc当地 tggca agttagcgg tca cgtc当地 cgt aaccaccc acaccgccc	6120
cgtttaatgc ggc当地 tacag ggc当地 gctact atggttgc当地 tgacgagacc gt当地 aacgtg	6180
ctttctctgt tg当地 aactcaga gggggagacta aacaggaggc cggat当地 aagg gat ttttagac	6240
aggaacggta cggc当地 actgg attaccaag ggccctgtc当地 tggccttattt ttataggtt	6300
aatgtcatga taataatgtt ttcttagacg tggatggca ctttccggg aaatgtgc当地	6360
ggaaaccctta ttgttttattt ttcttaataa cattcaataa tggatccgc当地 catgagacaa	6420
taaccctgtat aaatgtctca ataatattga aaaaggaaaga gtatgatgat tcaacattc	6480
cgttgc当地 cccctt ttgtcggca ttggcccttc ctgttttgc当地 tcaaccaggaa	6540
acgctgggtga aagtaaaaaga tgctgaaagat cggatgggtg cggatggg ttacatcgaa	6600
ctggatctca acagcggtaa gatccttgc当地 agtccctgc当地 cggaaacgt tttccaaatg	6660
atgagacttct taaaaggatc ctatgtggc ggggtattat cc当地 ctgttgc当地 cggccggcaaa	6720
gagcaactcg gtc当地 cccatcatc acactattct cagaatgact tggatgatc ctc当地 accagtc	6780
acagaaaaaggc atcttacggta tggcatgaca gtaagagaat tatgc当地 gtgc tgccat当地 aacc	6840
atgagtgata acactgccc当地 caacttactt ctgacaacgc当地 tggaggacc gaaggagacta	6900
accgctttt tgccacaacat gggggatcat gtaactcgcc ttgatgttgc当地 ggaaccggag	6960

cgatgaatgg ccatcacaaa cgacgaggctt gacaccacga tgcctgcgc aatggcaaca 7020
acgttgccgca aactattaac tggcgaacta cttaactctag cttccggcaca acaattaata 7080
gactggatgg aggccgatcaa agttgcaggaa ccactcttcg ctcggccct tccggctggc 7140
tggtttattt ctgtataatc tggagccggg gaggctgggt ctccgggtat cattgcaggc 7200
ctggggccgac atggtaagcc ctcccgatc gtatgtatct acacgcacggg gagtcaggca 7260
actatggatg aacgaaatag acagatcgct gagataggtg ctcactgtat taagcatttgg 7320
taactgtcg accaagtta ctcatatata cttagatgtt attaaaaact tcatttttaa 7380
tttctctage gcgttgacat tgattattgtt ctatgttata atagtaatca attacgggg 7440
cattatgttca tagccccatata atggaggatcc gcgttacata acttacggta aatggccgc 7500
ctggctgacc gcccacgcac ccccccgttacat tgacgttcaat aatgcgtat gttccatag 7560
taacgcacaaat aaggactttc catggacttc aatgggttga ctatttacgg taaactgcac 7620
acttggcagt acatcaagtgc tatcatatgc caagtgacgc cccttattgtc gtcaatgcacg 7680
gttaatggcc cgcctggcat tatggccagt acatgcacctt atggggacttt cctacttggc 7740
agtacatcta cgtttagtgc atgcgttata ccatgggtat gggtttttgg cagtagatca 7800
atggggctgg atagccgttt gactcacggg gatttccaag tctccacccccc attgacgtca 7860
atggggatgtt gttttggcac caaatcaac gggactttcc aaaatgtcgta aacaactccg 7920
ccccattgtac gcaaatgggc ggtaggctgt tacgggtgggaa ggtcttatata agcagagctc 7980
tctcggttac t 7991